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Christopher W. Kennerly, Esq. Baker Botts L.L.P. 6th Floor 2001 Ross Avenue Dallas, TX 75201-2980			EXAMINER	STERRETT, JONATHAN G
			ART UNIT	PAPER NUMBER
			3623	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/829,476	LI, YIKANG
	Examiner Jonathan G. Sterrett	Art Unit 3623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 26 May 2005.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-43 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-43 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

1. This **Final Office Action** is responsive to applicant's amendment filed May 26, 2005. Applicant's amendment of May 26, 2005 amended **Claims 1, 10, 24 and 38**.

Currently **Claims 1-43** are pending.

Response to Amendments

2. The rejection of **Claim 10** under 35 U.S.C. 112 is withdrawn.

The rejection of **Claims 1-14** under 35 U.S.C. 101 is withdrawn.

Response to Arguments

3. The applicant's arguments regarding **Claims 1 and 2** have been fully considered, but they are not persuasive.

The claim cites "determining a locally optimal base sales volume series for the iteration according to the input data series" and "selecting a globally optimal base sales volume series from among the locally optimal base sales volume series determined using the iterative process".

According to Maraval, the different filters cited (Kalman and WK) both serve to filter a sales volume series (paragraph 6 line 3-6) and provide both locally and globally optimal estimates of the unobserved components (i.e. the base sales volume) because they use a minimum mean-squared error estimator that minimizes error and hence provide local and global optimization of the estimate of the unobserved component (i.e. base sales volume). The filters operate in a recursive (i.e. iterative fashion) (see page 41 paragraph 7 line 1-2).

The applicant asserts that the expression "is a state space expression that generates only a single state value rather than a series". However the WK filter cited by Maraval (page 43 paragraph 3 line 1-2) is described as "the WK filter adapts itself to the series under consideration", meaning since the series is comprised of a number of sales volumes in a period, the filter is operating on each volume in the period to extract the optimal unobserved component (i.e. the base sales volume). Furthermore on page 42, equations 1.35a and 1.35b have subscripts denoting time t – (see paragraph 8.2 line 7-10) denoting that the filter operates on elements in the series x_t (i.e. base sales volumes) in the series from time $t=-\infty$ to time $t=+\infty$, i.e. every element in the series. As far as the assertion that "each iteration of the second Maravall expression gets the next period's base volume", the Maravall expression is clear that the filter operates on base volumes respectively for a given period – (see equation 1.36, the filter operates on series x_t and not x_{t+1}). That is the filter operates on every x_t in a period (i.e. the series) and filters the entire series, not just for a single period in the series.

Claim Rejections - 35 USC § 103

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 103 that form the basis for the rejections under this section made in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maravall as described in the following document:

Maravall, Augustin, "Unobserved Components in Economic Time Series" from Handbook of Applied Econometrics, 1995, Blackwell Publishers Ltd, pp. 12-72.

Regarding Claim 1, Maravall teaches:

accessing an input data series for a series of time periods, the input data for each time period comprising at least an actual sales volume for the time period (page 14 paragraph 2 line 10, quarterly series of US GNP data is accessed in analysis of unobserved components in an economic time series), the actual sales volumes for the series of time periods collectively comprising an actual sales volume series (Page 37 paragraph 4 line 6-7, 140 observations of GNP are an actual sales volume series);

within each iteration of an iterative process (page 41 paragraph 7 line 1-3, since the Kalman filter approach uses a MMSE approach, it is iterative beginning with starting conditions and running a set of recursions):

applying a low-pass filter to the actual sales volumes series to extract low frequency components representing a base sales volume series for the iteration (page 16 paragraph 1 line 5-7, low frequency filters used to capture the series variation associated with long term movements, including base sales volumes; page 16 paragraph 1 line 10-13, depending on the filter, components representing a base sales volume series can be extracted from various frequency points in the economic data series),

determining a locally optimal base sales volume series for the iteration according to the input data series (page 41 paragraph 3 & 4, optimal estimation of unobserved components, i.e. base sales volume, determined using minimum mean squared error estimators);

selecting a globally optimal base sales volume series from among the locally optimal base sales volume series determined using the iterative process (page 43 paragraph 5 line 4, equation gives globally optimal estimator for unobserved components, i.e. base sales volume), the globally optimal base sales volume series comprising an estimated base sales volume for each time period (page 37 paragraph 4 line 7-9, the model provides a very good fit and provides an estimated base sales volume for each time period in the sample data); and

making one or more of the estimated base sales volumes available for use in connection with at least one business analysis (page 13 paragraph 1 line 4-7, unobserved components used in detection and analysis of business cycle at methodical and applied levels).

Maravall also discloses performing the filtering steps using processing units (page 41 paragraph 7 line 5-7, the filter provides an easy to program, computationally efficient algorithm, i.e. is performed using a computer processing unit – see also page 42 paragraph above 8.2 line 4-6, both filters are computationally efficient, i.e. can be programmed into algorithms and executed using computers, i.e. processing units.).

Maravall does not explicitly teach performing all the above steps on a computer, i.e. inputting data, filtering and making data accessible for use in business analysis.

However, Official Notice is taken that it is old and well known in the art to use computers (i.e. processing units) to perform these steps because they provide a faster, more efficient way to manipulate data.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Maravall, regarding filtering a data series to identify unobserved components (i.e. base volume series) to include the step of using a computer (i.e. processing unit) to perform the various steps associated with inputting a data series, filtering it and making the results available for use in a business analysis, because said steps would be made easier, more efficient and faster by using a computer.

Regarding Claim 2, Maravall teaches wherein the iterative process is performed according to a smoothing parameter that is independent of time periods associated with the input data series (page 16 paragraph 1 line 5-7, filters are low pass, screening out higher frequency signals - it is inherent that low frequency filters are smoothing in nature; page 16 paragraph 1 line 15 - page 17 paragraph 1 line 1, filters are independent of the time series under analysis).

Regarding Claim 3, Maravall teaches that unobserved components in a time series can be extracted through low frequency filters which provide the base of the series data (unobserved components, i.e. the base volume), the filtered data comprises other components acting in concert with the base volume to

constitute the entire inputted time series. Maravall teaches that the filter can be ad hoc, or essentially not based on a mathematical relationship, but arrived at through an estimated guess.

Maravall does not teach nested loop iteration of the ad hoc filter to input various values of the filter (e.g. smoothing parameter) i.e.:

a first parameter specifies the number of values the smoothing parameter can have, an iterative loop being performed within the iterative process for each value of the smoothing parameter; and

a second parameter specifies the number of iterations to be performed, inside the iterative loop, for each value of the smoothing parameter.

The examiner takes official notice that nested loops are old and well known in the art. They provide the means for providing a 2 dimensional matrix where the inside loop increments (or decrements) between two values to specify one of the axes of said matrix and the outside loop increments (or decrements) between two values to specify the other axis of said matrix. Said matrix comprises values that can be used as inputs to other parts of the algorithm. This technique is an efficient way to generate values to be inputted into other parts of an algorithm.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Maravall, as discussed above, with providing a nested loop iteration of the smoothing parameter, because it would provide an efficient means to generate various values of the smoothing parameter.

Regarding Claim 4, Maravall wherein the smoothing parameter will have approximately ten thousand values according to the first parameter and, according to the second parameter, approximately three iterations will be performed inside the iterative loop for each value of the smoothing parameter (page 19 paragraph 2 line 1-5; Maravall teaches the use of ad hoc filters because they are simple and easy to use which is an important property when there is the need to estimate unobserved components in real world applications with thousands of series).

Regarding Claim 5, Maravall teaches using low pass filters to extract unobserved components in a time series for use in business analysis including that of marketing analysis (page 13 paragraph 1 line 4-6).

Maravall does not teach:

the input data series is stored in a multi-dimensional database comprising at least product, geography, and time dimensions; and
each input data value in the input data series is associated with a particular intersection of members within the product, geography, and time dimensions.

The examiner takes official notice that it is old and well known in the art for marketing data to be stored in a multidimensional database where the data comprises at least product, geography and time. Marketing data associated with a company's sales is usually tracked by what was sold, what sales region, and when. This data is commonly used in marketing and sales analysis because it provides useful information regarding how well marketing efforts, including those

of promotions and couponing, are being performed in various regions, are in increasing a company's profitability.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Maravall, as discussed above, with storing the input data series comprising at least product, geography and time dimensions in a multi-dimensional database, because it would provide a useful input into performing a marketing and sales analysis on the data to improve a company's marketing efforts to maximize profit.

8. Claims 6-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maravall in view of Leszczyc as described in the following document:

Leszczyc, Peter; Bass, Frank M, "Determining the Effects of Observed and Unobserved Heterogeneity on Consumer Brand Choice", 1998, John Wiley & Sons, pp.1-115.

Regarding Claim 6, Maravall teaches using low pass filters to extract unobserved components in a time series for use in business analysis including that of marketing analysis (page 13 paragraph 1 line 4-6).

Maravall does not teach:

an incremental price reduction value associated with one or more promotional tactics conducted in the time period; the incremental price reduction values for the time periods collectively comprising an incremental price reduction series; and

values for one or more promotion variables that reflect whether associated

promotional tactics are conducted during the time period or reflect relative weights accorded associated promotional tactics conducted during the time period, the values for each promotion variable collectively comprising a promotion variable series for that promotion variable, one or more of these promotional tactics selected from the group consisting of:

- a temporary price reduction for the item;
- a promotional insert packaged with the item;
- a promotional display for the item; and
- an advertisement for the item.

Leszczyc teaches:

an incremental price reduction value associated with one or more promotional tactics conducted in the time period, the incremental price reduction values for the time periods collectively comprising an incremental price reduction series (page 104 Table IV, price special is a dummy variable indicating when a price reduction was taken in the series); and

values for one or more promotion variables that reflect whether associated promotional tactics are conducted during the time period or reflect relative weights (page 104 Table IV, advertising and price specials are dummy variables indicating whether or not advertising and price specials occurred in the series.) accorded associated promotional tactics conducted during the time period, the values for each promotion variable collectively comprising a promotion variable series for that promotion variable, one or more of these promotional tactics selected from the group consisting of:

a temporary price reduction for the item (page 104 Table IV, price special variable;

a promotional insert packaged with the item (page 104 Table IV, advertising variable or coupon variable);

a promotional display for the item; and

an advertisement for the item.

Leszczyc teaches the correct use of his model eliminates bias and allows for correct marketing strategies and inferences to be developed (page 1 paragraph 1 line 1-3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Maravall, as discussed above, with the teachings of Leszczyc, as discussed above, because it would have allowed a company to use base sales volume as an unobserved component in a regression model to successfully predict the outcome of one or more marketing campaigns and allow a company to maximize profit.

Regarding Claim 7, Maravall teaches extracting the base sales volume series (i.e. unobserved component) in order to isolate the unobserved component from the other economic components (page 12 paragraph 1 line 1-4) and that this approach allows for further business analysis (page 13 paragraph 1 line 4-6). Maravall teaches that time series data is composed of a combination of several components with the unobserved components.

Maravall does not teach:

solving a regression equation that involves the actual sales volume series, the base sales volume series resulting from application of the low-pass filter, an incremental price reduction series, and one or more promotion variable series.

Leszczyc teaches accounting for unobserved components in his regression model (page 96 paragraph 3 line 1-3) and that doing so improves the fit of the estimated function (page 98 paragraph 4 line 8).

Leszczyc teaches:

solving a regression equation (page 102, equation 4) that involves the actual sales volume series (page 103, line 7-8, 1474 consumers with 12,111 purchase occasions), an incremental price reduction series (page 104 Table IV, "Price special" variable indicating a price reduction), and one or more promotion variable series (page 104 Table IV, "Coupon" and "Advertising").

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Maravall, as discussed above, with the teachings of Leszczyc, because including the base volume series in the regression model would have improved the fit of the resulting equation and improved forecast accuracy.

Regarding Claim 8, Maravall does not teach:

solving the regression equation to determine values for estimated coefficients associated with the incremental price reduction series and the one or more promotion variable;

computing an error associated with use of the estimated coefficients;

to reduce bias, considering the error in selecting the locally optimal base sales volume series.

Leszczyc teaches

solving the regression equation to determine values for estimated coefficients associated with the incremental price reduction series and the one or more promotion variable series (page 108 Table VII-a, estimated coefficients); computing an error associated with use of the estimated coefficients (page 103 paragraph 1 line 3, maximum likelihood estimation standard iteration minimizes errors associated with fitting coefficients);

to reduce bias, considering the error in selecting the locally optimal base sales

volume series (page 103 paragraph 1 line 3-5, MLE iteration is used, considering the error until best fit is achieved).

Leszczyc teaches accounting for unobserved components in his regression model (page 96 paragraph 3 line 1-3) and that doing so improves the fit of the estimated function (page 98 paragraph 4 line 8).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Maravall, as discussed above, with the teachings of Leszczyc, because using a base sales volume as an unobserved component in a regression analysis would have improved the fit of the equation and thereby improved the equation's ability to accurately forecast.

Regarding Claim 9, Maravall does not teach:

eliminating all the locally optimal base sales volume series having negative values for the estimated coefficient for the incremental price reduction series; and

of the remaining locally optimal base sales volume series, selecting the locally optimal base sales volume series for which an R^2 statistical measure has a maximum value.

The examiner takes official notice that it is old and well known in the art of regression analysis to discard coefficients by inspection that have negative values where positive ones are clearly expected. In a multivariate equation where one independent variable is known to have a positive influence on the dependent variable, a regression analysis result stating that the coefficient of said independent variable is negative would cause the practitioner to disregard and discard that coefficient.

The examiner takes official notice that it is old and well known in the art to select a regression equation among alternatives that has the maximum R^2 value. It is old and well known in the art that R^2 varies from 0 to 1 where 0 indicates no correlation and 1 indicates perfect or complete correlation.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the collective teachings of Maravall and Leszczyc, as discussed above, with eliminating series where the coefficients for the incremental price reduction series has a negative value and of the remaining series, selecting the locally optimal base sales volume series for which an R^2 has

a maximum value, because it would improve the accuracy of the regression equation for use in later forecasting.

Regarding Claim 10, Maravall does not teach:

eliminating series for which an R^2 statistical measure less than 0.2; of the remaining base sales volume series, selecting the locally optimal base volume series having the estimated coefficient for the incremental price reduction series with the least negative value.

The examiner takes official notice that it is old and well known in the art to discard the results of a regression analysis for which the R^2 statistical measure is a low value, including less than 0.2. Low R^2 values indicate a low level of correlation between the fitted equation and the data in question. Using regression equations with low R^2 values in forecasts will provide forecast data that is less likely to provide accurate forecasts as opposed to regression equations with higher R^2 's (R^2 varies from 0 to 1).

The examiner takes official notice that it is old and well known in the art for a price reduction to increase sales volumes. The underlying mechanism for this is the law of supply and demand. Lower prices stimulate higher sales volumes because a larger portion of buyers are willing to buy a good at a lower price. An equation which indicated a negative increase in sales as a result of a price reduction would be contrary to underlying economic principles. It would be obvious to a practitioner to select coefficients which have the least negative value because the equation would conform more to underlying economic principles and provide better accuracy in use in forecasting.

It would have been obvious to one of ordinary skill in the art to modify the teachings of Maravall and Leszczyc, as discussed above, with eliminating coefficients whose R2 was less than 0.2, and selecting coefficients in an incremental price reduction series with the least negative values, because it would result in a regression equation that provide better forecasting accuracy in predicting the result of various marketing tactics.

Regarding Claim 11, Maravall does not teach wherein less than approximately thirty-five percent of the values of the estimated coefficients have incorrect signs indicating a decrease in base sales volume when in reality an increase should occur.

The examiner takes official notice that it is old and well known in the art of statistics for regression analysis coefficients to have confidence intervals associated with them. Confidence intervals can vary as determined by the practitioner. In the current claim, a confidence interval for the regression coefficients would be 65%.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the collective teachings of Maravall and Leszczyc, as discussed above, with calculating a 65% confidence interval for the regression coefficients, because it would provide a measure of certainty as to how accurate the regression coefficients were for use in knowing the uncertainty associated with forecasting.

Regarding Claim 12, Maravall teaches wherein approximately ninety-five percent of the values of the estimated coefficients have correct signs indicating an increase in base sales volume when in reality an increase should occur.

The examiner takes official notice that statistical confidence intervals are old and well known in the art. A 95% confidence interval states that an outcome is expected to be within certain limits 95% of the time.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the collective teachings of Maravall and Leszczyc, as discussed above, with providing a 95% confidence interval for the regression equation to determine the statistical likelihood of accuracy for later use in forecasting.

Regarding Claim 13, Maravall teaches using his econometric models in forecasts (page 55 paragraph 2 line 12, equation for forecast at time "T").

Maraval does not teach wherein the business analysis comprises the calculation of increased sales volume associated with a promotional tactic based on one or more estimated base sales volumes.

Leszczyc teaches wherein the business analysis comprises the calculation of increased sales volume associated with a promotional tactic based on one or more estimated base sales volumes (page 1 paragraph 1 line 1-3, incorrect modeling can lead to incorrect forecasts and assumptions about marketing strategy; including unobservable components, i.e. base sales volumes, in a mathematical model improves its accuracy, Table IV, promotional tactics

including couponing and price specials used in model for determining the timing and frequency of purchases).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Maravall, as discussed above, with the teachings of Leszczyc to use a mathematical model to predict the impact of promotional tactics on increased sales volumes, because it would enable a company to improve its marketing strategy to maximize revenue and profit.

Regarding Claim 14, Maravall teaches using his econometric approach of modeling an unobserved component in an economic time series in business analysis (page 13 paragraph 1 line 4-6). Maravall teaches forecasting (page 55 paragraph 2 line 12).

Maravall does not teach wherein the business analysis is selected from the group consisting of:

- promotional planning;
- optimal mark down scheduling,
- complement analysis, and
- cannibalization analysis.

Leszczyc teaches using his modeling technique in promotional planning and optimal market down scheduling (page 104 table IV, promotional planning consisting of prices specials, advertising and couponing) as well as complement analysis and cannibalization analysis (page 1 paragraph 2 line 2-3, heterogeneity is useful in modeling variables in a consumer's choice process, which includes understanding complementary products and cannibalization of products).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Maravall, as discussed above, with wherein the business analysis is selected from the group consisting of promotional planning, optimal mark down scheduling, complement analysis and cannibalization analysis because it would enable the use of unobserved components to further understand and clarify a marketing strategy to maximize the profits of a company.

Claims 15-43 recite limitations already handled by the rejection of Claims 1-14 above, therefore the same rejection applies.

Conclusion

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan G. Sterrett whose telephone number is 571-272-6881. The examiner can normally be reached on 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on 571-272-6729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JGS 8-01-05

Susanna Diaz
SUSANNA M. DIAZ
PRIMARY EXAMINER

Att 3623